UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/776,067	02/02/2001	Behrooz Rezvani	VELCP001X3	9374

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EXAMINER
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ART UNIT	PAPER NUMBER
2634	

DATE MAILED: 10/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO 90C (Rev 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/776,067	REZVANI ET AL.
	Examiner	Art Unit
	Sudhanshu C. Pathak	2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _Feburary 2nd, 2001_.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _2-21_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _2-21_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _Feburary 2nd, 2001_ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1. Claims 2-to-21 are pending in the application.

2. Claim 1 has been cancelled.

Drawings

3. Figures 1 & 2 should be designated by a legend such as "Prior Art"

   because only that which is known is illustrated.

   Corrective Action is required.

4. Figures 3 & 4 designate an "RX" chain to include the element

   "FRAME/ENCODE" (Fig. 3, element 336 & Fig. 4, elements 440, 444) and

   "TX" chain to include the element "DEFRAME/DECODE" (Fig. 3, element

   332 & Fig. 4, element 434, 428), this should actually be reversed. The

   "TX" and "RX" transceiver chains are reversed.

   Corrective Action is required.

Specification

5. Applicant is reminded of the proper content of an abstract of the
   disclosure.

   A patent abstract is a concise statement of the technical disclosure of the
   patent and should include that which is new in the art to which the invention
   pertains. If the patent is of a basic nature, the entire technical disclosure may
   be new in the art, and the abstract should be directed to the entire disclosure.
   If the patent is in the nature of an improvement in an old apparatus, process,
   product, or composition, the abstract should include the technical disclosure
   of the improvement. In certain patents, particularly those for compounds and
   compositions, wherein the process for making and/or the use thereof are not
   obvious, the abstract should set forth a process for making and/or use
   thereof. If the new technical disclosure involves modifications or alternatives,
   the abstract should mention by way of example the preferred modification or
   alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:
(1) if a machine or apparatus, its organization and operation;
(2) if an article, its method of making;
(3) if a chemical compound, its identity and use;
(4) if a mixture, its ingredients;
(5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.
The abstract of the disclosure discloses a method and apparatus for x-DSL modem supporting multiple x-DSL line codes, however the abstract does not disclose a concise description of the apparatus as to how the multiple line codes are supported.

6. The specification on Page 6, line 21, refers to Fig. 2, element 212 as an "universal line card", however in Fig. 2, element 212 actually refers to an analog front end (AFE)

Corrective Action is required.

7. The specification on Page 14, line 6-7, refers to "which implement CAP QUAM"; this should actually be "which implement CAP QAM".

Corrective Action is required.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 2, 10 & 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding to Claims 2 & 10:

- The claim refers to an xDSL modem comprising a coder for coding digital data in <u>at least</u> DMT <u>and</u> CAP line code.

  It is not clear if this implies a xDSL modem comprising a coder <u>for a DMT line code or CAP line code</u> or a modem for coding <u>for DMT and CAP line codes</u>.

- The claim also refers to an xDSL modem comprising a <u>Fourier transform engine operating as a base band-to-carrier band</u> converter, but the claim further refers to xDSL modem comprising <u>a converter coupled to the Fourier transform engine for converting base band-to-carrier band.</u>

  It is not clear weather the fourier transform engine operates as a base band-to-carrier band converter or the modem comprises a <u>separate</u> converter coupled to fourier transform engine for converting base band-to-carrier band.

- The claim refers to an xDSL modem comprising a coder (...and vice-versa), a fourier transform engine (...and vice-versa), a converter (...and vice-versa), and an analog portion (...and vice-versa).

  It is not clear what the term <u>"vice-versa"</u> is referring to in terms of each component of the xDSL modem.

Regarding to Claim 6:

- The claim refers to a <u>"frequency domain equalizer (FEQ).....of the modem for time domain equalization (TEQ)"</u>.

The frequency domain equalizer is for frequency domain

equalization while a time domain equalizer is implemented for time

domain equalization.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for

all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 2-4, 10-13 & 18-20 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Mannering et al. (6,137,839) in view of Verbin et al.

(6,411,657).

Regarding to Claims 2-4, 10-13 & 18-20, Mannering discloses an XDSL

modem (Fig. 1a-e & Fig. 2a-c & Column 1, lines 10-15, 35-50) comprising

multiple modulation schemes such as discrete multitone (DMT) and

carrierless AM/PM (CAP) (Column 4, lines 41-50 & Column 5, lines 1-15 &

Column 7, lines 55-65 & Column 8, lines 38-67 & Column 9, lines 15-22 &

Column 10, lines 38-57 & Fig. 10d). Mannering also discloses a

coder/decoder for coding/decoding both CAP and DMT modulation schemes

(Fig. 4a, element 36, 58 & Fig. 4b, element 714, 755 & Column 2, lines 62-67

& Column 3, lines 1-5 & Column 10, lines 50-57 & Fig. 10d). Mannering also

discloses the modem for both transmitting and receiving (transceiver) either

CAP and/or DMT (Column 11, lines 50-67 & Column 12, lines 20-67 & Fig.

10d). Mannering also discloses a fourier transform engine coupled to the coder and operating as a base band-to-carrier band converter and vice versa for the digital data encoded in the DMT line code and as a filter for the digital data encoded with the CAP line code (Fig. 4a, elements 38, 56 & Fig. 4b, element 716 & Column 2, lines 63-67 & Column 3, lines 23-50 & Column 4, lines 1-10). Mannering also discloses a digital-to-analog converter (DAC) coupled to the fourier transform block (for DMT) and filter block (for CAP) to convert the digital signal to an analog band signal (Fig. 4a, element 42 & Fig. 4b, element 717 & Fig. 6c, element 614 & Fig. 6d, element 644). Mannering discloses implementing the modem in the DSP containing various programs for implementing different line codes (Column 9, lines 4-14 & Column 10, lines 43-50). However, Mannering does not specifically disclose a converter for converting between base band-to-carrier digital data.

Verbin discloses a high-speed transmitter used in an xDSL transmission system (Column 1, lines 5-40 & Column 4, lines 29-40 & Fig. 1). Verbin also discloses an upconverter for converting between base band-to-carrier digital data (Fig. 1, element 31 & Column 7, lines 20-30). Verbin also discloses a downconverter coupled to a receive path for carrier band-to-base band conversion of the digital data (Fig. 1, element 37 & Column 9, lines 33-46). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Verbin teaches implementing a digital up converter and down converter for converting the base band digital signal to a carrier band digital and vice-versa and this can be implemented in the xDSL

transceiver as described in Mannering so as to process and up/down convert

the baseband signal to an carrier band signal so as to transmit/receive the

xDSL signal.

12.   Claims 5-9, 14-17 & 21 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Mannering et al. (6,137,839) in view of Verbin et al.

(6,411,657) in further view of Matsumoto (PG-PUB 2002/0067811).

Regarding to Claims 5-9, 14-17 & 21, Mannering in view of Verbin

discloses a xDSL modem for transmitting/receiving signals with multiple

modulation schemes including DMT and CAP as described above.

Mannering also discloses a plurality of buffers located throughout the transmit

path between the selected one of the coders and the fourier transform engine

for buffering the plurality of communication channels for pipelined processing

(Fig. 1b, elements "FIFO", "BUFFER" & Fig. 4a, element 36 & Column 7, lines

35-44 & Column 26, lines 60-67). However, Mannering in view of Verbin

does not disclose the transmit path to include a gain scaler for scaling DMT

sub-symbols and CAP symbols.

Matsumoto discloses a communication apparatus modem for an xDSL

communication system such as ADSL (Specification, Page 1, Paragraphs 1-3

& Fig.'s 1-4). Matsumoto also discloses a gain scaler on the transmit path for

scaling DMT sub-symbols associated with each DMT symbol (Fig. 4, element

89 & Specification, Page 5, Paragraph 47). Matsumoto further discloses the

fourier transform engine converting on the transmit path the scaled DMT sub-

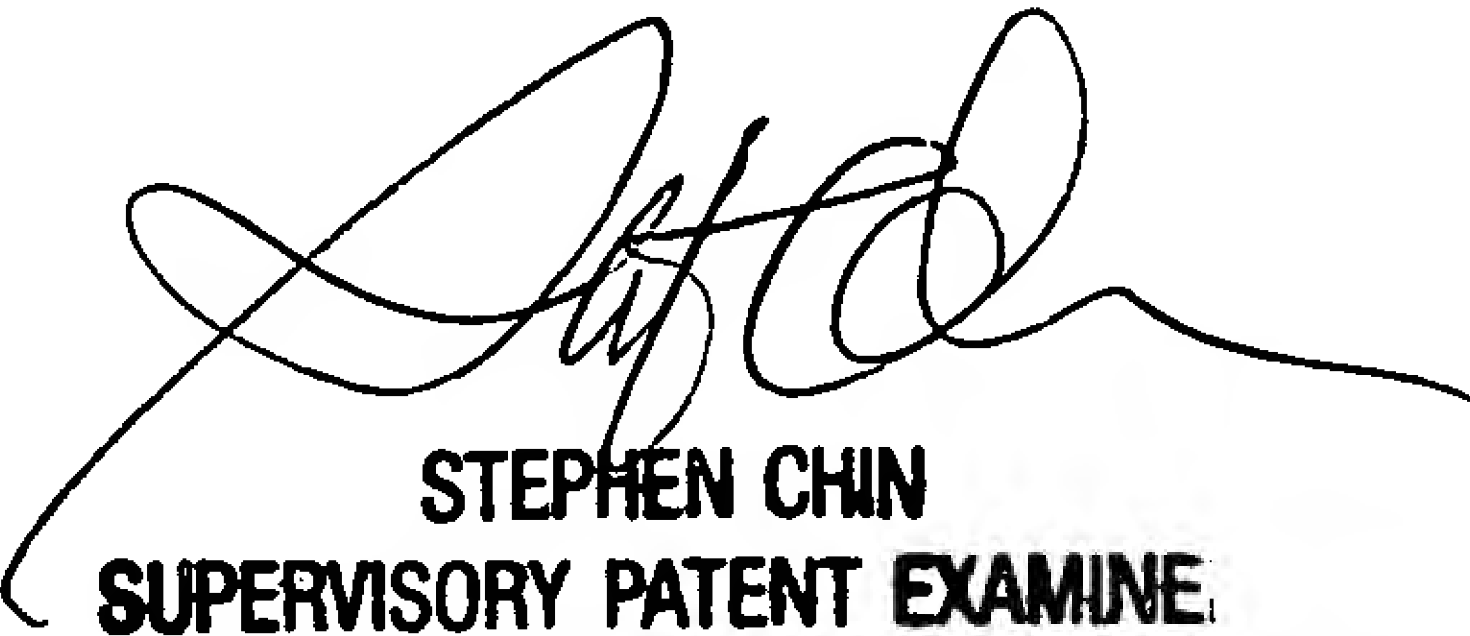symbols supplied by the gain scaler for the digital data in the DMT line code

(Fig. 4, elements 89, 90 & Specification, Page 6, Paragraph 52). Matsumoto

also discloses a frequency domain equalizer (FEQ) on the receive path (Fig.'s

2 & 4, element 66), and a time domain equalizer for time domain equalization

(TEQ) (Fig.'s 2 & 4, element 63) for the equalization of symbols

(Specification, Page 3, Paragraph 23-24 & Specification, Page 4, Paragraph

31-35). Matsumoto also discloses buffers in the receive and transmit paths

so as to provide pipelined processing (Fig. 4, elements 89, 64). Therefore, it

would have been obvious to one of ordinary skill in the art at the time of the

invention that Matsumoto teaches implementing a gain scaler in the transmit

chain of the xDSL modem and a frequency and time domain equalizers in the

receive chain and this can be implemented in the encoder as described in

Mannering in view of Verbin so as to provide the required energy so as to

map the received symbols in the receiver and to equalizer the time domain

and frequency domain distortions of the channel on the received signal.

Furthermore, the gain scaler is implemented after the encoder or is included

in the encoder and can be implemented after the encoder on both the DMT

and/or CAP modulation schemes to provide the IFFT processing (for DMT)

and filter processing (for CAP) high gain symbols for transmission over a

noisy channel, thus satisfying the limitations of the claim. Furthermore, this

can be implemented in the modem as described in Mannering in the

component as described in the DMT part of the modem (Fig. 4a, element 58)

and in the CAP part of the modem (Fig. 4b, element 750), thus satisfying the

limitations of the claims.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sudhanshu C. Pathak whose telephone number is (571)-272-3038. The examiner can normally be reached on M-F: 9am-6pm.

- If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571)-272-3056

- The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

- Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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